BNL-95011-2011-AB

RETRIEVALS OF CLOUD OPTICAL DEPTH AND EFFECTIVE RADIUS FROM A THIN-CLOUD ROTATING SHADOWBAND RADIOMETER (TC-RSR)

Bangsheng Yin, *ASRC, State University of New York*
Qilong Min, *State University of New York at Albany*
Minzheng Duan, *Institute of Atmospheric Physics, Chinese Academy of Science*
Andrew Vogelmann, *Brookhaven National Laboratory*
Mary Jane Bartholomew, *Brookhaven National Laboratory*
David Turner, *NOAA*

For presentation at
The Second Science Team Meeting of the
Atmospheric System Research (ASR) Program,
San Antonio, TX
March 28-April 1, 2011

Environmental Sciences Department/Atmospheric Sciences Division
Brookhaven National Laboratory

U.S. Department of Energy
Office of Science

ABSTRACT

A thin cloud-rotating shadowband radiometer (TC-RSR) was developed and deployed in a field campaign at the ARM SGP site. The TC-RSR measures the forward scattering lobe of the direct solar beam (i.e., the solar aureole) through a thin cloud. We applied Min and Duan's retrieval algorithm to the field measurements of TC-RSR to derive cloud optical depth, effective radius, and LWP from the measured forward scattering lobe of the direct solar beam. After carefully calibrating and pre-processing, the retrieved cloud optical depth, effective radius, and LWP from TC-RSR showed reasonable agreement with other retrievals of MFRSR, MWR, and AERI. Our results indicate that the TC-RSR is able to simultaneously retrieve cloud optical depth, effective radius, and LWP for optically thin water clouds.